

①
Cont.

a [non-planar] layer having a non-planar surface within the device structure, positioned at height x , where $0 \leq x < z$, between heights x and z ; [the light emission property is a]

contacts for applying a voltage across the active region; and

wherein the refractive index [that] varies in the plane perpendicular to light output and the light output is in spatially fixed modes.

4. (Original) A vertical cavity surface-emitting laser, as defined in claim 3, wherein the refractive index has a lengthscale on the order of the lasing wavelength.

5. (Original) A vertical cavity surface-emitting laser, as defined in claim 3, further comprising a substrate having a first side adjacent to the lower distributed Bragg reflector.

6. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, further including a texturing layer interposing the substrate and the device structure, wherein the non-planar layer is the texturing layer.

7. (Original) A vertical cavity surface-emitting laser, as defined in claim 6, wherein the texturing layer is patterned.

8. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

9. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

10. (Original) A vertical cavity surface-emitting laser, as defined in claim 5, wherein non-planar layer is a first surface of the substrate adjacent the lower Bragg reflector.

a² *Mark¹*

11. (Original) A vertical cavity surface-emitting laser, as defined in claim 10, wherein the first surface is patterned.

a² *Mark¹*

12. (Currently Amended) A vertical cavity surface-emitting laser, as defined in claim [3] 5, wherein the non-planar layer introduces a phase mismatch in the device structure.

a² *Mark¹*

13. (Original) A vertical cavity surface-emitting laser, as defined in claim 12, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

a² *Mark¹*

14. (Original) A vertical cavity surface-emitting laser, as defined in claim 13, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

a³ *Mark¹*

15. (Currently Amended) A vertical cavity surface-emitting laser, as defined in claim [3] 5, further comprising a planarizing plane within the device structure, positioned at height y, where $x < y < z$.

a³ *Mark¹*

16. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, between heights x and y, the refractive index varies in the plane perpendicular to the light output.

a³ *Mark¹*

17. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, wherein the refractive index has a lengthscale on the order of the lasing wavelength.

a³ *Mark¹*

18. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, further comprising a substrate having a first surface adjacent to the lower distributed Bragg reflector.

19. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, further including a texturing layer interposing the substrate and the device structure, wherein the non-planar layer is the texturing layer.

20. (Original) A vertical cavity surface-emitting laser, as defined in claim 19, wherein the texturing layer is patterned.

21. (Original) A vertical cavity surface-emitting laser, as defined in claim 19, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

22. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

23. (Original) A vertical cavity surface-emitting laser, as defined in claim 18, wherein non-planar layer is a first surface of the substrate adjacent the lower Bragg reflector.

24. (Original) A vertical cavity surface-emitting laser, as defined in claim 23, wherein the first surface is patterned.

25. (Original) A vertical cavity surface-emitting laser, as defined in claim 15, wherein the non-planar layer introduces a phase mismatch in the device structure.

26. (Original) A vertical cavity surface-emitting laser, as defined in claim 25, wherein the non-planar layer is a layer within at least one of the upper and lower distributed Bragg reflectors.

27. (Original) A vertical cavity surface-emitting laser, as defined in claim 25, wherein the layer within at least one of the upper and lower distributed Bragg reflectors is patterned.

a4 *unc* 7

28. (Currently Amended) A method for manufacturing a vertical cavity surface emitting laser comprising the steps of:

preparing a substrate such that there is a [texturing] layer having a textured surface;

depositing a lower distributed Bragg reflector;

depositing an active layer;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

a5 *unc* 7

29. (Original) A method for manufacturing a vertical cavity surface emitting laser, as defined in claim 28, further comprising the step of removing the substrate after the step of fabricating electrical contacts.

30. (Currently Amended) A method for manufacturing a vertical cavity surface emitting laser comprising the steps of:

depositing a lower distributed Bragg reflector having a [texturing] layer having a textured surface;

depositing an active layer;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

31. (Currently Amended) A method for manufacturing a vertical cavity surface emitting layer comprising the steps of:

depositing a lower distributed Bragg reflector;

depositing an active layer having a [texturing] layer having a textured surface;

depositing an upper distributed Bragg reflector; and

fabricating electrical contacts for applying a voltage across the active layer.

32. (Currently Amended) A method for manufacturing a vertical cavity surface emitting layer comprising the steps of:

depositing a lower distributed Bragg reflector;

depositing an active layer;

O⁵
Cont.

depositing an upper distributed Bragg reflector having a [texturing] layer having a
textured surface; and

fabricating electrical contacts for applying a voltage across the active layer.